



U.S. Department  
of Transportation

**Pipeline and  
Hazardous Materials  
Safety Administration**

400 Seventh Street, S.W.  
Washington, D.C. 20590

**AUG 25 2005**

DOT-E 9001  
(TENTH REVISION)

EXPIRATION DATE: June 30, 2007

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Chesterfield Special Cylinders  
Sheffield, Yorkshire, England  
(U.S. Agent: BIE International Inc.  
Houston, TX)  
(Formerly: Chesterfield Cylinders Ltd)
2. PURPOSE AND LIMITATIONS:
  - a. This exemption authorizes the manufacture, mark, sale and use of a non-DOT specification cylinder conforming with all regulations applicable to a DOT 3T Specification cylinder, except as modified herein, for the transportation in commerce of the materials authorized by this exemption. This exemption provides no relief from any Hazardous Materials Regulation (HMR) other than as specifically stated herein.
  - b. The safety analyses performed in development of this exemption only considered the hazards and risks associated with transportation in commerce.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.301a, 173.302a, 173.304a, and 175.3; in that non-DOT specification cylinders are not authorized.

**NOTE:** This does not relieve the holder of this exemption from securing and maintaining a valid approval for retesting cylinders from the Associate Administrator for Hazardous Materials Safety.

5. BASIS: This exemption is based on the application of Chesterfield Special Cylinders dated July 10, 2005, submitted in accordance with § 107.109 and additional information dated August 16, 2005.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description				
Proper Shipping Name		Hazard Class/ Division	Identification Number	Packing Group
Air, compressed		2.2	UN1002	N/A
Argon, compressed		2.2	UN1006	N/A
Boron trifluoride, compressed		2.3	UN1008	N/A
Carbon dioxide		2.2	UN1013	N/A
Ethylene, compressed		2.1	UN1962	N/A
Helium, compressed		2.2	UN1046	N/A
Methane, compressed or Natural gas (with high methane content)		2.1	UN1971	N/A
Neon, compressed		2.2	UN1065	N/A
Nitrogen, compressed		2.2	UN1066	N/A
Nitrous oxide		2.2	UN1070	N/A
Oxygen, compressed		2.2	UN1072	N/A

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7. SAFETY CONTROL MEASURES:

a. PACKAGING - Prescribed packaging is a non-DOT specification steel cylinder made in compliance with Drawings 47482P dated January 11, 1983 and 47593P dated August 9, 1983 on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA), and DOT 3T(\$\$ 178.35 and 178.45) except as follows:

§ 178.35(f) Markings. Each cylinder must be marked "DOT-E 9001" in lieu of "DOT 3T".

§ 178.45(a) *Type, size and service pressure*

Each cylinder must be of seamless construction with one end concave to pressure, the bottom to be convex to pressure. The maximum water capacity is 120 pounds with a minimum service pressure of 1,800 p.s.i.

§ 178.45(b) *Material, steel.*

The provisions remain the same except the steel analysis must conform to the following:

ANALYSIS TOLERANCES

<u>Element</u> (percent)	<u>Ladle analysis</u>	<u>Check Analysis</u>	
		<u>Under</u>	<u>Over</u>
Carbon.....	0.33 to 0.40	0.03	0.04
Manganese.....	0.60 to 1.05	0.04	0.04
Phosphorus (max)...	0.015	....	0.01
Sulfur (max).....	0.015	....	0.003
Silicon.....	0.15 to 0.35	0.02	0.03
Chromium.....	0.80 to 1.15	0.05	0.05
Molybdenum.....	0.15 to 0.25	0.02	0.02

§ 178.45(c) *Manufacture*

Add the following:

(6) The thickness of the bottoms of the cylinders must be at least two times the minimum wall thickness of the cylindrical shell; such bottom thickness to be measured within an area bounded by a line representing the points of contact between the cylinder and floor when the cylinder is in a vertical position.

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(7) Each new design and any significant change to any acceptable design must be qualified for production by testing prototype samples as follows:

(a) Three samples must be subjected to 100,000 pressure reversal cycles between zero and service pressure or 10,000 pressure reversal cycles between zero and test pressure, at a rate not in excess of 10 cycles per minute without failure.

(b) Three samples must be pressurized to destruction and failure must not occur at less than 2.5 times the marked cylinder service pressure. Each cylinder must remain in one piece. Failure must initiate in the cylinder sidewall in a longitudinal direction. Rate of pressurization must not exceed 200 psi per second.

(8) In this specification "significant change" means a 10 percent or greater change in cylinder wall thickness, service pressure, or diameter; a 30 percent or greater change in water capacity or base thickness; any change in material; over 100 percent increase in size of openings; or any change in the number of openings.

(9) After all shell forming operations and prior to closing in, the cylindrical section of each shell must be examined in accordance with ASTM Standard A-388-80 using the angle beam technique. The equipment used must be calibrated to detect a notch equal to five percent of the design minimum wall thickness. Any discontinuity indication greater than that produced by the five percent notch must be cause for rejection of the shell unless the discontinuity is repaired within the requirements of this specification.

#### § 178.45(d) Wall thickness

The minimum wall thickness must be such that the wall stress at the minimum specified test pressure does not exceed 67 percent of the minimum tensile strength of the steel as determined by the physical tests required in paragraphs (j) and (k).

A wall stress of more than 90,500 p.s.i. is not permitted.

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In no case may wall thickness be less than 0.210 inch.

(1) \* \* \*

(2) Does not apply.

§ 178.45(h) *Ultrasonic examination*

Add the following:

Wet magnetic particle examination for detecting the presence of quench cracks may be substituted for the ultrasonic examination prescribed in this section. When magnetic particle examination is performed it must be done after the hydrostatic test on the cylindrical section of each cylinder in accordance with ASTM Standard E 709-80. Any cylinder found to have a quenching crack must be rejected and may not be requalified.

b. TESTING - Each cylinder must be requalified for use in accordance with § 180.205 as prescribed for DOT 3T cylinders.

c. OPERATIONAL CONTROLS -

(1) These cylinders may not be used for carriage of gases that would cause hydrogen embrittlement of the steel.

(2) Filling limits specified in § 173.302a(b) are authorized.

(3) The following provisions apply to the transportation of methane:

(i) Each cylinder must be filled only with non-corrosive compressed natural gas (scrubbed to remove acid gases) and may not contain any liquefied gas. At any time the cylinder may not contain gas having more than:

(A) 0.5 lbs. of water per million cubic feet at standard temperature and pressure (STP) (60°F, 30 inches Hg).

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(B) 0.1 grain of hydrogen sulfide per 100 cubic feet at STP as determined by ASTM D 2385-76 Test for Hydrogen Sulfide and Mercaptan Sulfur in Natural Gas (Cadmium-Sulfate Iodometric Titration Method).

(C) Total Soluble Sulfides other than H<sub>2</sub>S or soluble sulfides must be less than 0.1 grain per 100 cubic feet at STP.

(D) One percent by volume of oxygen.

(E) Three percent by volume of carbon dioxide.

(F) Four percent total (including but not limited to items (D) & (E) of this paragraph) by volume of all non-hydrocarbon gases (excluding nitrogen).

(ii) The shipper is responsible for establishing procedures to determine the composition and impurity level of the gas at each facility used for filling the cylinders, and to verify a compliance to the requirements of this exemption. Records of the gas composition and impurity levels must be maintained for three years.

(iii) Cylinders that become contaminated with H<sub>2</sub>S or soluble sulfides must be condemned.

(iv) During any unloading operation each cylinder must be inclined to an angle that lowers the centerline of the cylinder at the discharge end to a point lower than any portion of the opposite end of the cylinder.

8. SPECIAL PROVISIONS:

a. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this exemption for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this exemption.

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b. A person who is not a holder of this exemption, but receives a package covered by this exemption, may reoffer it for transportation provided no modifications or changes are made to the package and it is offered for transportation in conformance with this exemption and the HMR.

c. A current copy of this exemption must be maintained at each facility where the package is offered or reoffered for transportation.

d. Each packaging manufactured under the authority of this exemption must be marked with a registration symbol designated by the Office of Hazardous Materials Exemptions and Approvals for a specific manufacturing facility.

e. A current copy of this exemption must be maintained at each facility where the package is manufactured under this exemption. It must be made available to a DOT representative upon request.

f. Reports:

(1) Prior to the initial shipment of cylinders made to any specific design, a report of test results specified in § 178.45(n) must be submitted to the OHMEA.

(2) The manufacturer of the cylinder under this specification must retain the test reports required by this specification for 15 years from the original test date on the cylinder.

g. Cylinders made under this exemption may be transported in an upright position.

h. Transportation of Division 2.1 (flammable gases) and Division 2.3 (gases which are poisonous by inhalation) are not authorized aboard cargo vessel or aircraft unless specifically authorized in the Hazardous Materials Table (§ 172.101).

i. Transportation of oxygen is only authorized by aircraft when in accordance with § 172.102(c)(2) Special Provision A52 and §§ 175.85(h) and (i).

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9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel and cargo aircraft only.
10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel or aircraft used to transport packages covered by this exemption. The shipper must furnish a current copy of this exemption to the air carrier before or at the time the shipment is tendered.
11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:
- o All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
  - o Persons operating under the terms of this exemption must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
  - o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this exemption, including display of its number, when this exemption has expired or is otherwise no longer in effect.

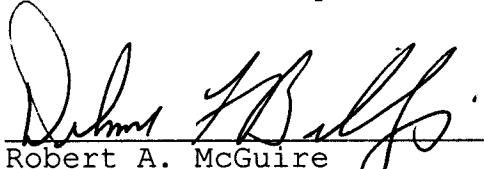
12. REPORTING REQUIREMENTS: Shipments or operations conducted under this exemption are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 - Immediate notice of certain hazardous materials incidents, and 171.16 - Detailed hazardous materials incident reports. In addition, the grantee(s) of



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this exemption must notify the Associate Administrator for Hazardous Materials Safety -- OHMEA, in writing, of any incident involving a package, shipment or operation conducted under terms of this exemption.

Issued in Washington, D.C.:

  
Robert A. McGuire

Associate Administrator for  
Hazardous Materials Safety

**AUG 25 2005**

DATE

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Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, Department of Transportation, Washington, D.C. 20590. Attention: PHH-31.

Copies of this exemption may be obtained by accessing the Hazardous Materials Safety Homepage at <http://hazmat.dot.gov/exemptions> Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

PO: KW/MT/sln